HOW I DO IT

Modified Stapled Transanal Rectal Resection (Starr) for Full Thickness Excision of Rectal Tumour

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Abstract

Introduction Traditionally, adenomatous rectal lesions and unexpected malignant polyps that could not be removed endoscopically are referred to surgery. Local excision is the treatment of choice, and several techniques have been proposed. The choice of the approach requires that the tumour is excised intact, with a low recurrence rate and limited morbidity. Local excision can be a straight forward or conversely a demanding procedure due to the restricted space in which the surgeon must work and the difficulty of achieving a satisfactory exposure.

Methods We describe a modified stapled transanal rectal resection for the excision of flat lesions with a diameter up to 2 cm and located between 5 and 12 cm from the anal verge.

Discussion and Conclusion In our experience, it is quick, simple, and easy to teach but it has not previously been reported. It provides full thickness resection with adequate lateral margins. It overcomes some of the limits of the incomplete surgical field exposure and difficult manipulation, since after the confectioning of double half purse-string suture, the suture and sectioning is made by the stapler device.

Background

The development of colorectal adenomas is frequent in the Western countries. The estimated lifetime risk is approximately 40%.[1] One third of these lesions will be located in

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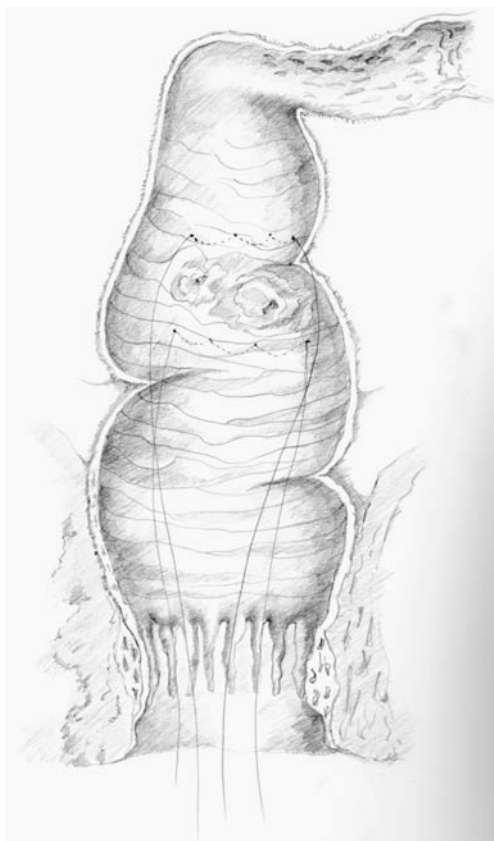Viale Oxford 81,
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the rectum, and about 10% will turn malignant.[2] Moreover, the constant diffusion of colorectal cancer screening will inevitably lead to an increased detention of adenomas and early rectal cancer. It is therefore expected that more rectal lesions will need endoscopic or surgical management in the forthcoming years.

Even with previous benign biopsies, the presence or absence of malignant cells may be determined only by complete excision (total biopsy). Indeed, unexpected invasive carcinoma can be found in up to 20% of patients after polyp removal.[3]

Traditionally, adenomatous rectal lesions that could not be removed endoscopically (large, sessile, or carpet-like polyps) are referred to surgery. After excision, unexpected malignant polyps are also referred to surgery to complete full thickness 'total biopsy'.

Local excision is the treatment of choice, and several techniques have been proposed. The choice of the approach requires that the tumour is excised intact, with a low recurrence rate and limited morbidity.[4]

There is much evidence that local excision, when complete, can be curative even in polyps containing

Figure 1 Two purse-string sutures are placed at least 1 cm above and below the lesion.

carcinoma in situ ($T1_{is}$) or initially invasive cancer with infiltration limited to the submucosal layer (T1), provided that pathology features are favourable and that adequate superficial and deep margins are obtained. Local excision of a rectal lesion can be a straightforward or, conversely, a demanding procedure because of the restricted space in which the surgeon must work and the difficulty of achieving a satisfactory exposure. Some of them are related to the characteristics of the polyp itself, such as size, morphology, nature, distance from the anal verge and longitudinal extension, while others are due to extrinsic factors like patient's constitution and health, rectal mobility and, obviously, surgeon's experience.[5,6]

Briefly, the three types of approaches commonly used for local surgical excision[6–13] are the following:

(a) The Kraske dorsal access or the Mason trans-sphincteric approaches or a combination of the two. These offer good exposure and are oncologically very effective but with high complications rate, mainly infectious and faecal fistula.

(b) The Parks transanal approach (and its variations according to Francillon and Faivre) is the most common and effective approach for tumours located

up to 12 cm from the anal verge. In expert hands, the recurrence rate is low, approximately 10% but can be as high as 36% with major complications. The tumour is excised using diathermy or harmonic scalpel.

Obviously, the use of a natural orifice (in the Parks approach) is accompanied by reduced space for surgical manipulation, difficult bleeding control (especially for posterior tumours), and incomplete field view (especially for higher tumours). As a consequence, incomplete and imprecise resection may follow.

To overcome these limits, several alternatives have been proposed, such as the use of 'endoscopic transanal resection' via a urologic resection device as initially described by Zinkin et al. for the palliation of obstructing rectal tumour and subsequently implemented for incisions of rectal adenomas and selected low rectal cancers. However, this often does not allow a full-thickness resection, and the recovered multiple specimens represent a challenge for an accurate pathologic evaluation.

(c) The transanal endoscopic microsurgery (TEM) allows full thickness resection under excellent view of the entire rectum (up to 18 cm from the anal verge). The limit is the cost of the device and its accessories and the necessary learning curve.
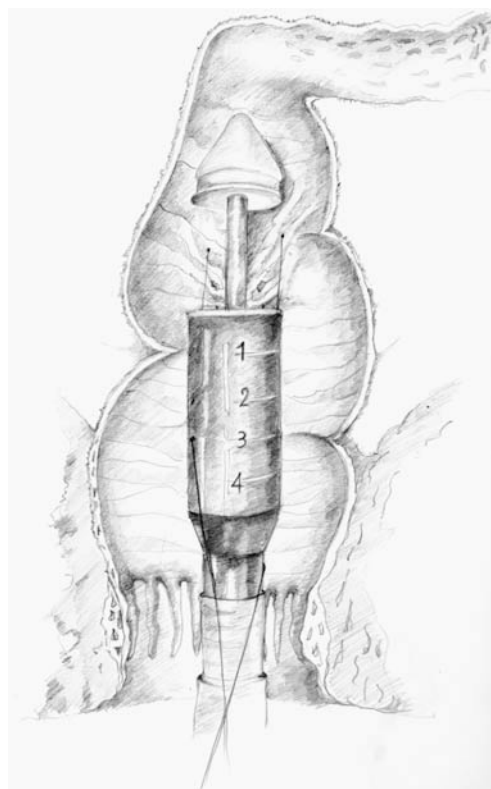

Figure 2 A 33-mm circular stapler is inserted above the lesion and the upper purse-string.

We describe our technique for flat lesions (sessile or carpet-like polyps), $T1_{is}$ and T1 cancer, with a diameter up to 2 cm and located between 5 and 12 cm from the anal verge using a circular stapler device. This represent a modification of the STARR implemented to treat obstructed defecation syndrome (ODS). In our experience, it is quick, simple and easy to teach, but it has not previously been reported. We used this technique in five patients (four males and one female). All patients underwent preoperative lesion biopsies and a full colonoscopy. Patients with proven cancer underwent endoscopic transrectal ultrasound evaluation in order to define the T and the N stages. Proven cancer patients underwent abdominal CT scan and pelvic MRI. Only patients with sessile polyps or T1N0 cancers were considered suitable for this technique. Only lesions less than 2 cm and located within 10 cm from the anal verge were treated. All stapled transanal rectal resections (STARR) provided full-thickness resection with adequate lateral superficial margins (>1 cm). Macroscopic appearance of the specimens was rectangular with a median size $3.54\pm1.2\times2.32\pm0.6$ cm. Median depth of resection was 0.88 ± 0.2 cm. Mean lesion size was 1.48 ± 0.7 cm. Pathology revealed T1 adenocarcinomas in three patients, one $T1_{is}$ carcinoma and one sessile adenoma with moderate dysplasia. During surgery, additional haemostatic sutures
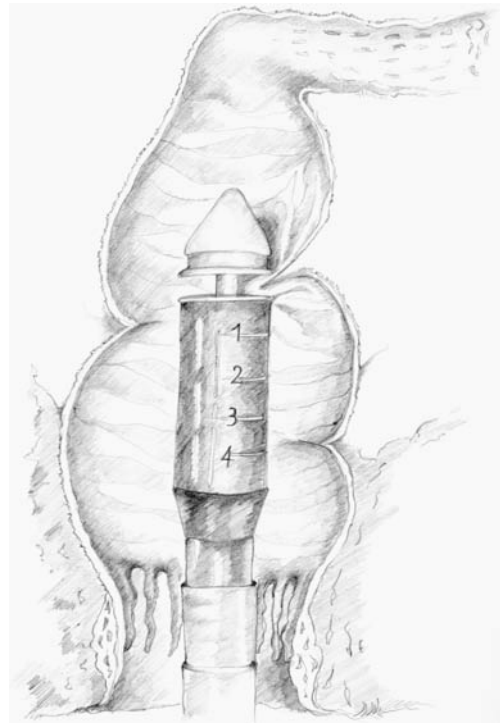

Figure 4 If a full thickness purse-string suture is performed, a full-thickness resection is expected.

Figure 3 The two double ends of the purse-string sutures are pulled down into the stapler.

Figure 5 End of the procedure. After stapler removal the staple line is observed. If bleeding occurs, additional haemostatic sutures are placed over the staple line.

were needed in two cases (3-0 vicryl). We did not observed any complications, and patients were discharged within 4 days. Only one patient experienced longer term tenesmus that lasted up to 5 months after surgery.

In our experience, this technique overcomes some of the limits of the incomplete surgical field exposure and difficult manipulation, since after the placement of the purse-string sutures, the resection is performed by the stapler device.

Surgical Technique

The day before surgery, patients receives a mechanical full bowel preparation. Preoperatively, a cleansing enema is also given. Patients receive routine antibiotic prophylaxis (cefotaxime 2 g and metronidazole 500 mg i.v.) at anaesthesia induction. Surgery is performed under general or caudal anaesthesia in lithotomy position. A circular stapler device is used. A disposable circular anal dilator and a purse-string suture anoscope are used as for a PPH procedure (PPH01, Ethicon Endo Surgery, Inc, Pomezia, Italy). The anal verge is gently lubricated and digitally dilated for 1 min with two fingers. The lubricated obturator is then inserted and left in situ for 1 min. At this point, four radial stitches (0 silk) are used to expose the anal verge and fix the perianal skin to the anal dilator (CAD 33 if a PPH set is used). Using 2-0 prolene (Ethicon, Somerville NJ, USA), a 180° purse-string suture is performed at least 1 cm above the rectal tumour. Purse-string stitches should include mucosa, submucosa, and rectal muscle wall (Fig. 1). A similar purse-string 180° suture is performed below the tumour. The two ends of the purse-string sutures are then secured on the right and left using small clamps.

A 33-mm circular stapler is then opened and the head inserted above the lesion and the upper purse string. The double ends of the purse-string sutures are inserted into the stapler as well as for anopexy or standard STARR for ODS and pulled down (Figs. 2 and 3). If full thickness purse strings have been performed the rectal wall including the lesion should be invaginated into the stapler head after pulling the purse-string ends (Fig. 4).

The stapler is then closed, held for 30 s (Fig. 5) and fired. In female patients with an anterior lesion, the posterior vaginal wall should be checked with fingers before firing. Occasionally, a minimal mucosal bridge with a staple connecting the two edges may occur, and this is easily cut using heavy scissors. If bleeding occurs, the suture line can be reinforced using interrupted 3-0 vicryl suture. The retrieved specimen is then oriented, pinned on a cork pad, properly labelled and sent for pathology evaluation. The presence of the 2-0 prolene stitches (previously used for the two purse-string sutures) in the retrieved specimen aids the identification of the upper and lower resection margins.

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